

## WHAT IS CLAIMED IS:

1. A plasma processing method of processing a substrate by controlling the application of a bias to the substrate independently of generation of plasma, comprising the steps of:
  - 5 modulating periodically an output value of a high-frequency voltage applied to a substrate base; and
  - changing a duty ratio of the period modulation for one of each processed substrate and for each of a plurality of processed substrates, wherein the duty ratio is defined as a ratio of a sub-period of a period of the
  - 10 periodic modulation, during which a large voltage of the output value of the high-frequency voltage is applied, to the period of the periodic modulation.